

Hair et al — Appln. No.:09/261,221

least once and strikes an electromagnetic radiation detector arranged at one lateral extreme of said vend space, said reflected beam defining a transverse cross sectional plane of the vend space below said at least one mechanism but above where said article, upon being vended, comes to rest in said customer-accessible hopper;

^a
B a machine control unit arranged for terminating operation of the respective at least one motor-powered mechanism; and

^{unit}
B control circuitry operatively connecting said at least one detector with said machine control computer, and arranged for providing a signal for causing the machine control unit to complete a vend cycle of said respective at least one mechanism upon said at least one detector sensing that electromagnetic radiation reaching said at least one collector as a result of electromagnetic radiation emission by said at least one emitter has temporarily diminished by a predetermined amount.

³⁷
59. (New) The optical vend-sensing system according to claim 58, wherein said electromagnetic radiation undergoes a plurality of reflections off of each reflecting surface.

⁴¹
38 60. (New) The optical vend-sensing system according to claim 58, wherein the emitter is a laser.

³⁹
61. (New) The optical vend-sensing system according to claim 58, wherein said two reflecting surfaces are differently angled interior portions of an elliptically shaped reflector.

⁴⁰
62. (New) An optical sensor, comprising:

Hair et al. — Appln. No.:09/261,221

two reflecting surfaces in a spaced apart, opposed relation;
 an emitter of electromagnetic radiation disposed between said reflecting surfaces; and
 a detector disposed between said reflecting surfaces and spaced apart from said
 emitter, said detector having an electromagnetic radiation detecting element,
 wherein said reflecting surfaces, said emitter, and said detector are constructed and
 arranged such that electromagnetic radiation emitted from said emitter is reflected off of each
 reflector at least once and strikes the electromagnetic radiation detecting element, said
 reflected electromagnetic radiation defining a detection region through which objects to be
 detected traverse.

43.
41
63. (New) An optical sensor according to claim 62, wherein said electromagnetic
 radiation undergoes a plurality of reflections off of each reflecting surface.

44.
42
64. (New) An optical sensor according to claim 62, wherein the emitter is a laser.

45.
43
65. (New) An optical sensor according to claim 62, wherein the emitter is
 mounted to one of said reflecting surfaces.

46.
44
66. (New) An optical sensor according to claim 62, wherein the detector is
 mounted to one of said reflecting surfaces.

47.
45
67. (New) An optical sensor according to claim 62, wherein said two reflecting
 surfaces are differently angled interior portions of an elliptically shaped reflector.

67

9

Hair et al. - Appln. No.:09/261,221

68. (New) A method of detecting a dispensed object, comprising:

emitting electromagnetic radiation in a beam between two reflecting surfaces that are in spaced apart, opposed relation to each other such that said beam is reflected off of each reflecting surface at least once and strikes an electromagnetic radiation detecting element, thus defining a detection region through which said dispensed object will traverse;

selecting a detection threshold that is exceeded when said object to be detected does not intercept said detection region and is not reached when said object intercepts said region; and

comparing a plurality of signals from said electromagnetic radiation detecting element, each at a different time, to said detection threshold.

69. (New) A method of detecting a dispensed object according to claim 68, wherein said electromagnetic radiation undergoes a plurality of reflections off of each reflecting surface.

70. (New) A method of detecting a dispensed object according to claim 68, wherein the electromagnetic radiation is emitted from an emitter that is mounted to one of said reflecting surfaces.

71. (New) A method of detecting a dispensed object according to claim 68, wherein the detection element is mounted to one of said reflecting surfaces.

72. (New) A method of detecting a dispensed object according to claim 68, wherein said emitting electromagnetic radiation emits pulsed radiation.

Q

Hair et al. — Appln. No.: 09/261,221

73. (New) A method of detecting a dispensed object according to claim 68, wherein said emitting electromagnetic radiation emits continuous radiation.

74. (New) A method of detecting a dispensed object according to claim 68, wherein said selecting a detection threshold is a dynamic selection that compensates for variations in electromagnetic radiation in said detection region that are slow relative to a time interval for said dispensed object to traverse said beam of electromagnetic radiation.

4635. (New) A vending machine, comprising:
an electromechanical dispensing unit having a plurality of product containment regions;

a payment and selection unit that is in communication with said electromechanical dispensing unit, wherein said payment and selection unit sends a signal to said electromechanical dispensing unit to dispense a selected product after a consumer has selected and satisfied payment for said selected product; and

an optical vend-sensing system disposed proximate to said electromechanical dispensing unit, said optical vend-sensing system being in communication with said payment and selection unit and said electromechanical dispensing unit,

wherein said vend-sensing system comprises:

two reflecting surfaces in a spaced apart, opposed relation;

an emitter of electromagnetic radiation disposed between said reflecting surfaces; and

a detector disposed between said reflecting surfaces and spaced apart from said emitter, said detector having an electromagnetic radiation detecting element,